



JPSS STAR Annual Meeting 2018



River Ice and Flooding Initiative

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28 August 2018



Proving Ground and Risk Reduction Program Background



JPSS PGRR Background Definitions



- **Proving Ground**

- Demonstration and utilization of data products by the end-user operational unit, such as a NWS Weather Forecast Office or Modeling Center.
- Promote outreach and coordination of new products with the end users, incorporating their feedback for product improvements

- **Risk Reduction**

- Development of new research and applications to maximize the benefits of JPSS satellite data
 - Example - use of Day Night Band for improved fog and low visibility products at night, benefiting transportation industry.
- Encourages fusion of data/information from multiple satellite, models and in-situ data
- Primary work is done at the algorithm and application developer's institution.
- Address potential risk in algorithms and data products by testing alternative algorithms.



JPSS PGRR Background



- The PGRR Program was established in early 2012, following the launch of the Suomi National Polar Partnership (SNPP) satellite on 28 Oct 2011
- Call-for-Proposals (CFPs)
 - The initial CFP in Jan 2012 resulted in 100 teams providing Letters-of-Intent (LOIs) with nearly 40 projects selected for funding
 - A second PGRR Program CFP went out in Dec 2014. PGRR Initiatives were used as a focus for the responses to this CFP. Over 130 LOIs were received.
 - A third PGRR CFP is in draft and will be sent out soon.
- These proposals went through a rigorous user-led selection – between 40-50 projects selected for funding each time
- Project managers work with the users to determine how best to use new JPSS data, and to quickly transition these capabilities to operations.



PGRR Proving Ground Initiatives Responding to User Feedback



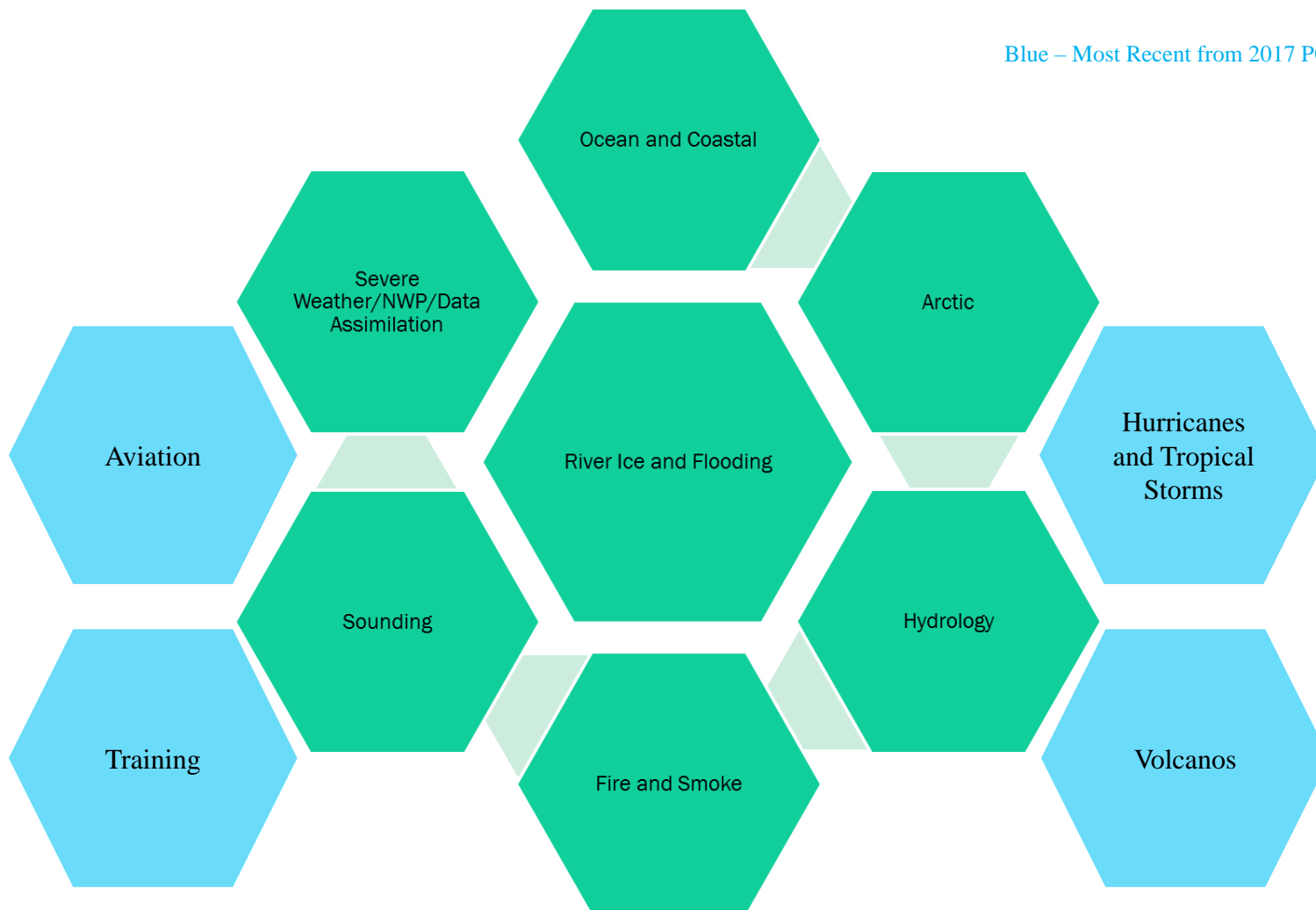
- The River Ice and Flooding Initiative was the first attempt at this new partnership and it was established in response to Galena AK flooding in May 2013.
- The Initiative included River Ice and River Flooding Project teams, direct broadcast SMEs, and National Weather Service River Forecast Center forecasters.
- The success of River Ice and Flooding Initiative led to creation of other initiatives that guided the 2014 PGRR CFP.
- Initiatives have proven to be critical forums where JPSS personnel, product developers, and users interact. The effort is to evaluate current and future JPSS Capabilities in operational environments to determine which of these capabilities should be transitioned to operations.



PGRR Initiatives List



Blue – Most Recent from 2017 PGRR CFP





PGRR Initiatives



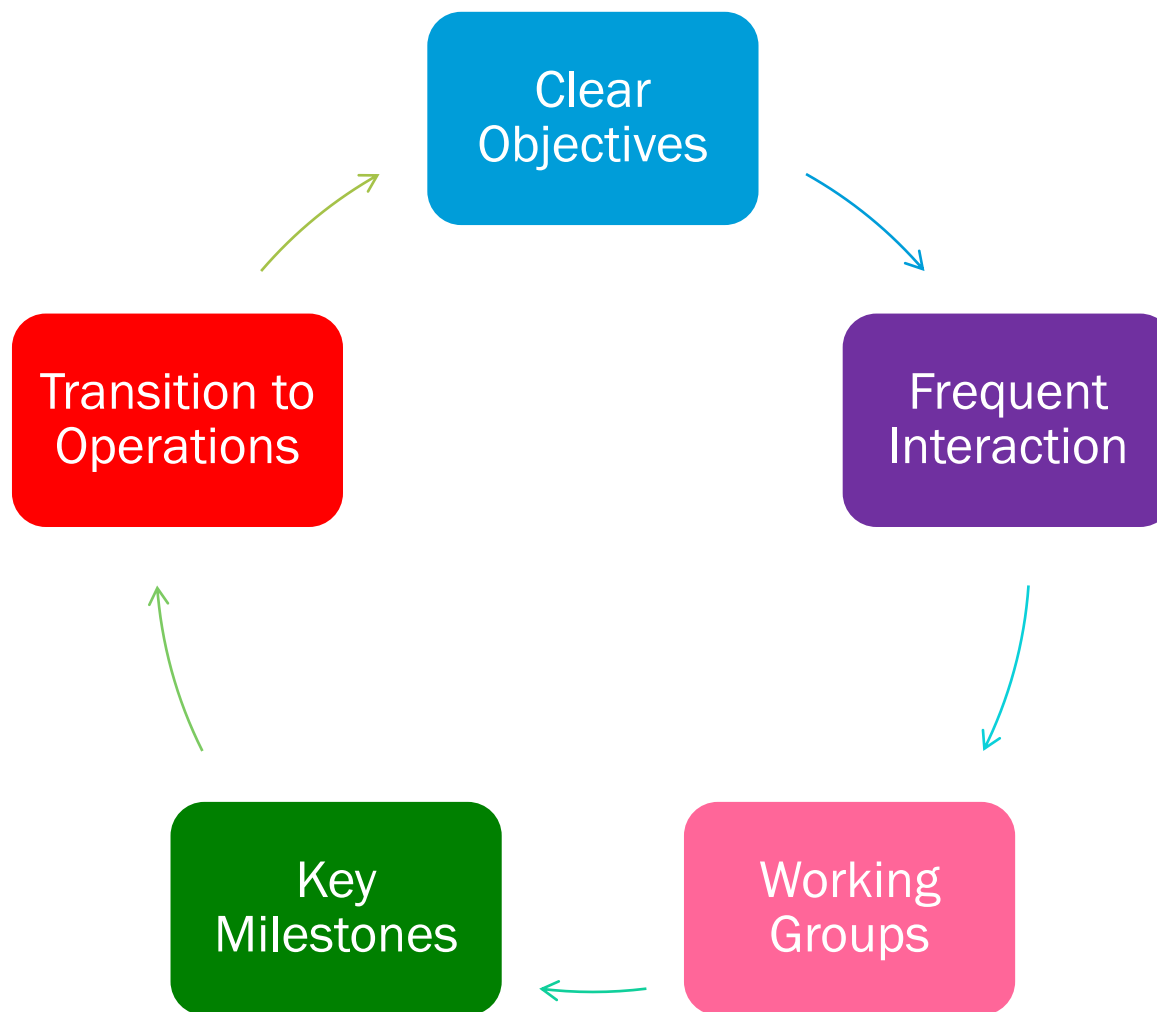
Initiative	Start Date
River Ice and Flooding	November 2013
Fire and Smoke	May 2014
Sounding Applications NOAA Unique CrIS/ATMS Processing System (NUCAPS)	July 2014
Hydrology	July 2015
Ocean and Coastal	March 2016
Severe Weather/NWP/Data Assimilation	March 2016
Arctic Initiative	June 2016
Hurricanes and Tropical Storms Initiative	June 2018
Aviation Initiative	June 2018
Training Initiative	June 2018
Volcano Initiative	June 2018



PGRR Initiatives Partners



PGRR Proving Ground Initiatives Best Practices





River Ice and Flooding Initiative



River Ice and Flooding Initiative Background



- The first PGRR Initiative joining River Ice and River Flooding into one effort and applied with great success during the 2013 Galena Flood in AK.
- Success resulted in the creation of new initiatives and more NWS River Forecast Center (RFC) involvement. Six RFCs are now regular participants.
- Worked with RFCs to provide their customers with VIIRS products to be included in their decision making systems. USA Corp of Engineer for flooding along the Illinois River as an example.
- Based on feedback from RFCs both the VIIRS River Ice and River Flood products were changed to improve their operational value.
- River Flood products have been used worldwide in response to flooding events.
- Established collaboration with the National Water Center.
- River Ice and Flooding Products key part of capabilities discussed during a NWS visit to Russia.
- Discussed with Coast Guard liaison about the use of the River Ice Product on decisions on ice breaker deployment.
- Established procedures to provide River Flood Product to FEMA to help their response to flooding events. Products critical to Hurricanes Harvey and Irma



River Ice and Flooding Initiative

The First Initiative and Most Mature



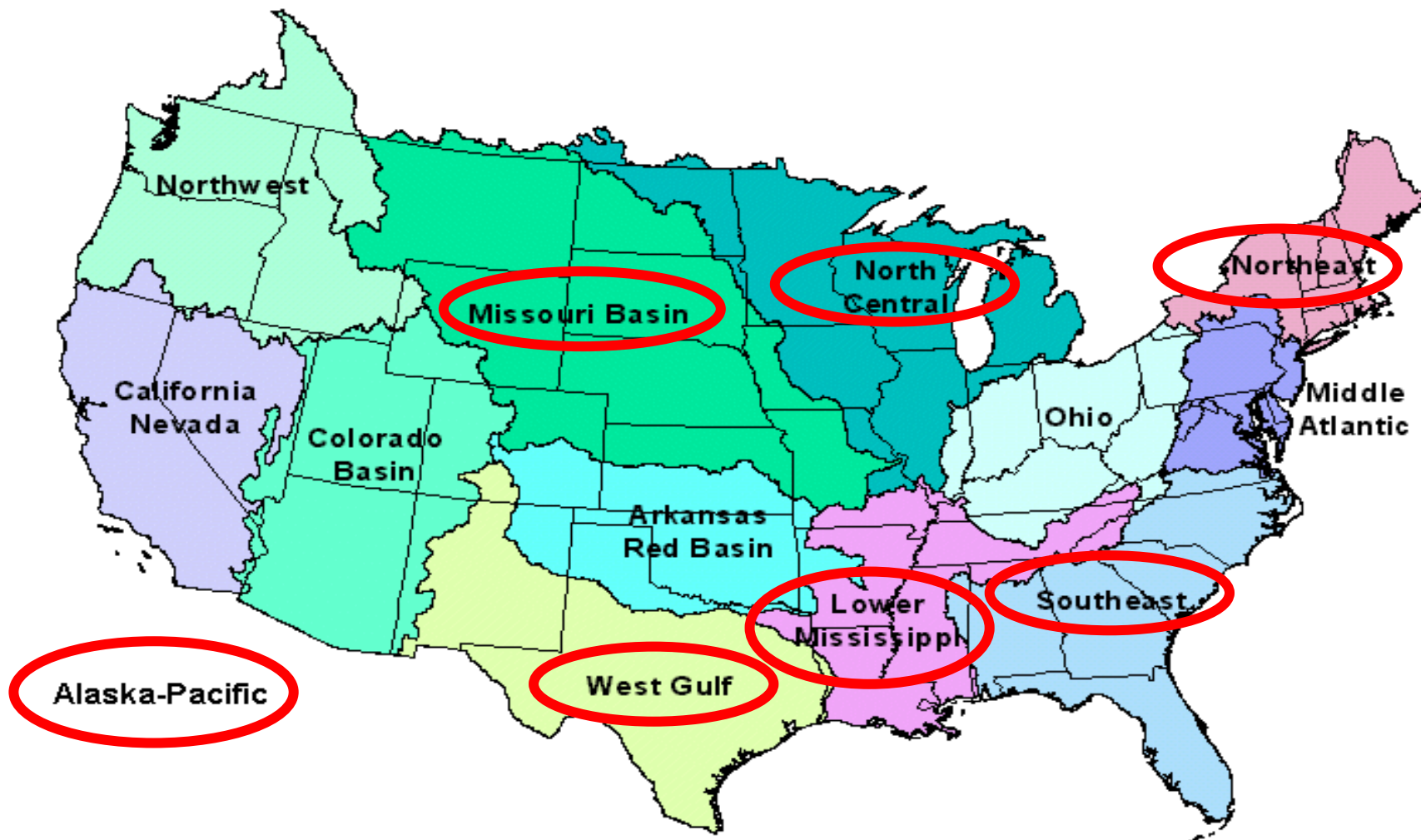
**PGRR Project
River Flood
Product**

**PGRR Project
River Ice
Product**

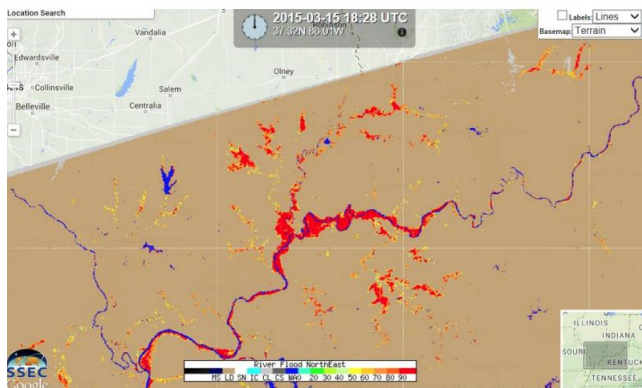




Success in Alaska Brings More Interest

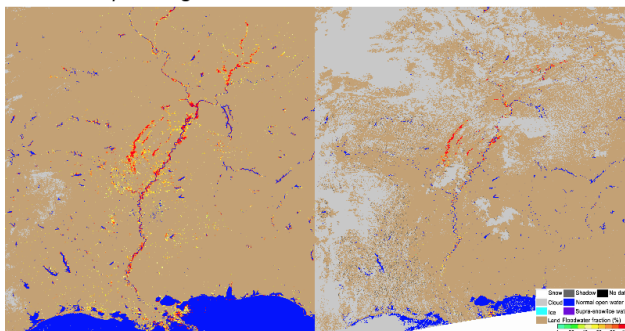


Keep Asking the Right Questions River Flood Mapping



If the product works in AK will it work elsewhere?

Frequent observations from GOES-16/ABI provide more clear-sky coverage for flood detection.



Can the GOES-R ABI create a product similar to VIIRS

Can the product respond to rapidly changing situations?

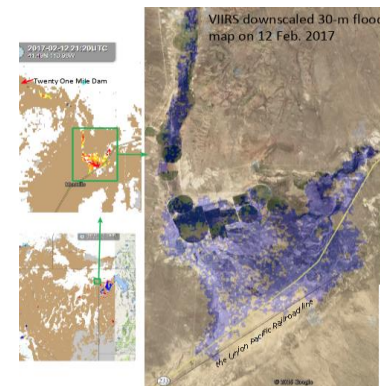
Nevada county declares emergency after earthen dam fails

THURSDAY, FEB. 9, 2017, 6:24 P.M.



On Wednesday, Feb. 8, 2017, 21 Mile Dam near Montello, Nev., broke and caused flooding to the Union Pacific railroad line near Lucin and flooded the town of Montello, Nev. The floods forced delays or rerouting for more than a dozen freight and passenger trains on a main rail line that runs through the area, said Union Pacific spokesman Justin E. Jacobs (Stuart Johnson / AP)

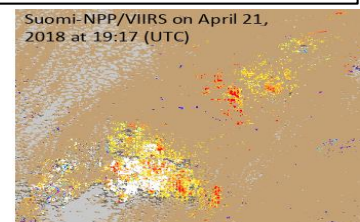
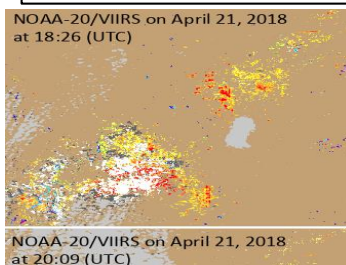
<http://www.spokesman.com/stories/2017/feb/09/nevada-county-declares-emergency-after-earthen-dam/>



Abnormal water was found after Twenty One Mile Dam was damaged around 8 Feb. 2017. Part of highway 233 and the Union Pacific Railroad line near Montello were inundated.



Does the product have other operational applications



With NOAA-20/VIIRS and Suomi-NPP/VIIRS flood maps, the water flow due to snow-melting in the north central region can be observed dynamically.

A Most Important Question

Would the VIIRS Flood Mapping Product be of Value to the International Community Assisting Them in Responding to their Flood Events?



Through the Use of the International Charter

Initiative Responds to International Charter

1

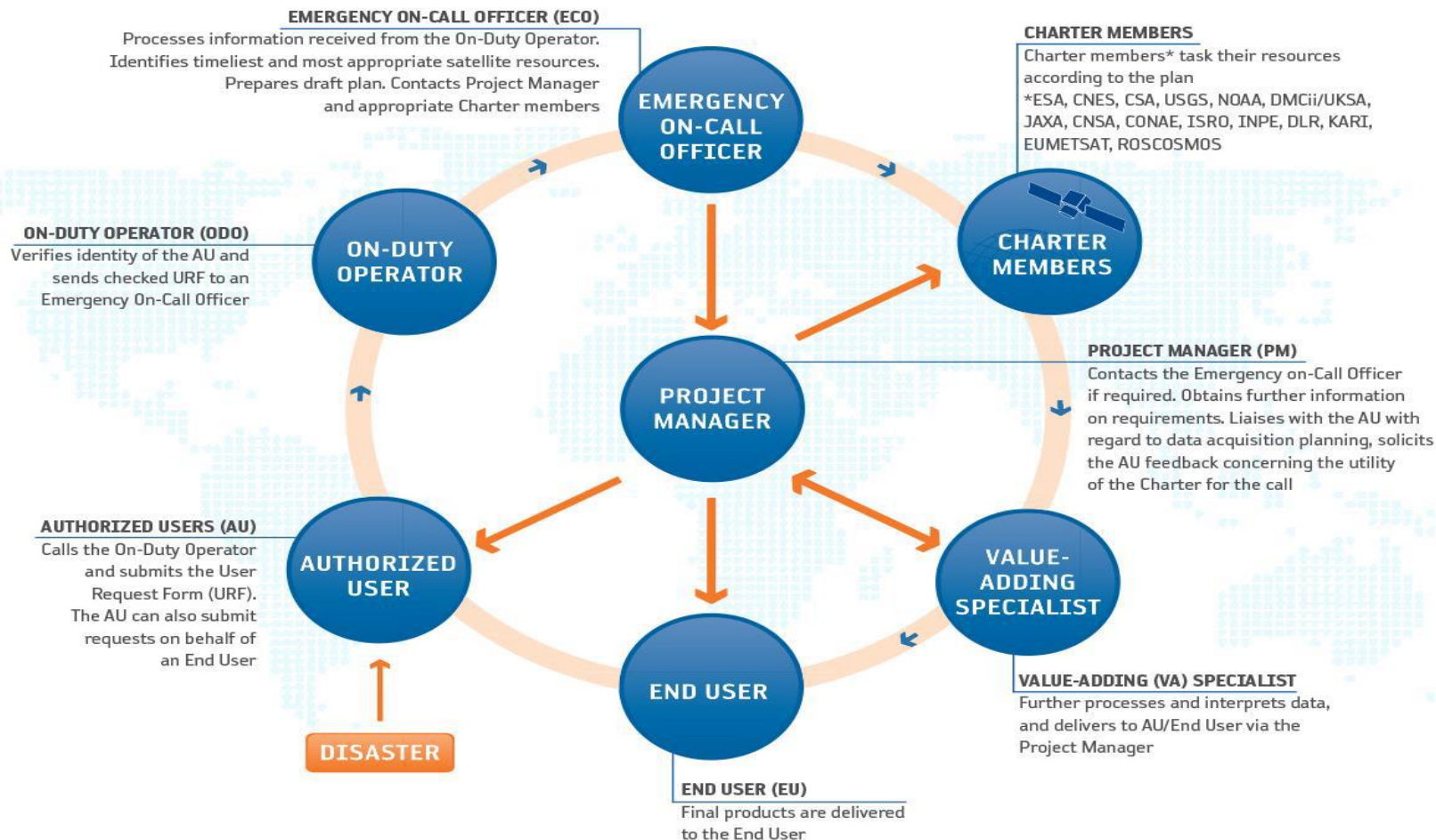
WHAT IS THE INTERNATIONAL CHARTER?

The Charter is a worldwide collaboration among space agencies to make satellite data available for the benefit of disaster management authorities during the response phase of an emergency.

The Charter is unique in being able to mobilize agencies around the world and benefit from their know-how and satellites through a single access point that operates 24 hours a day, 7 days a week at no cost to the user.

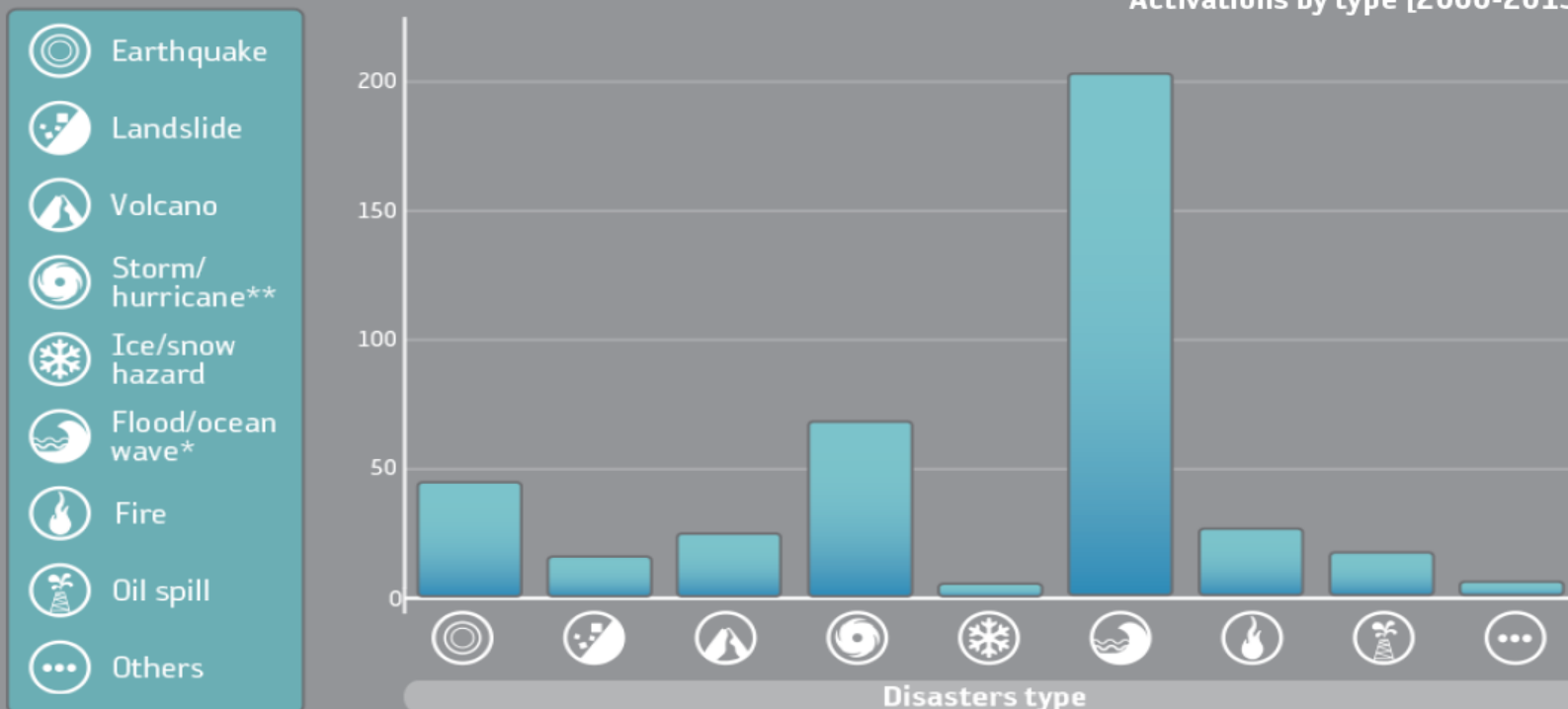
Successfully operating since November 2000, the Charter has brought space assets into action for many natural and technological disasters including floods, hurricanes, tsunamis, earthquakes, landslides, forest fires, volcanic eruptions, ice jams, and oil spills. Since its inception, the Charter has been activated in response to over 400 major disasters in more than 110 countries, including the 2004 Asian tsunami, the 2008 cyclone Nargis in Myanmar, the 2010 earthquake in Haiti, the 2010 flooding in Pakistan, the 2011 earthquake and tsunami in Japan, the 2012 cyclone Bopha and the 2013 super Typhoon Haiyan in the Philippines.

Activation of International Charter



Floods are a Worldwide Concern

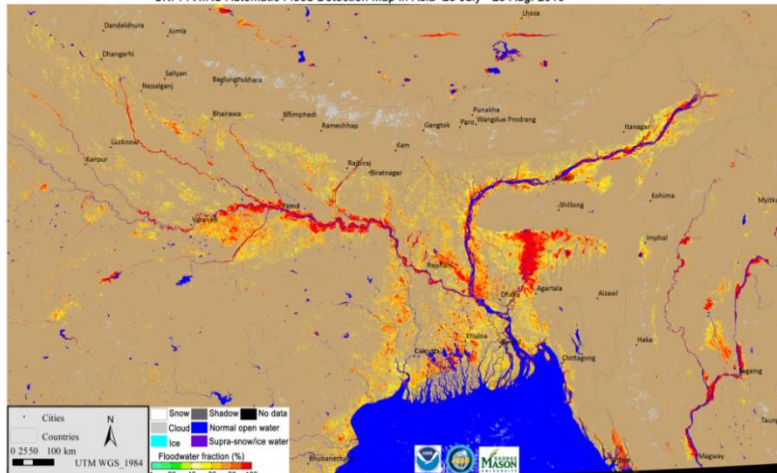
Activations by type [2000-2013]



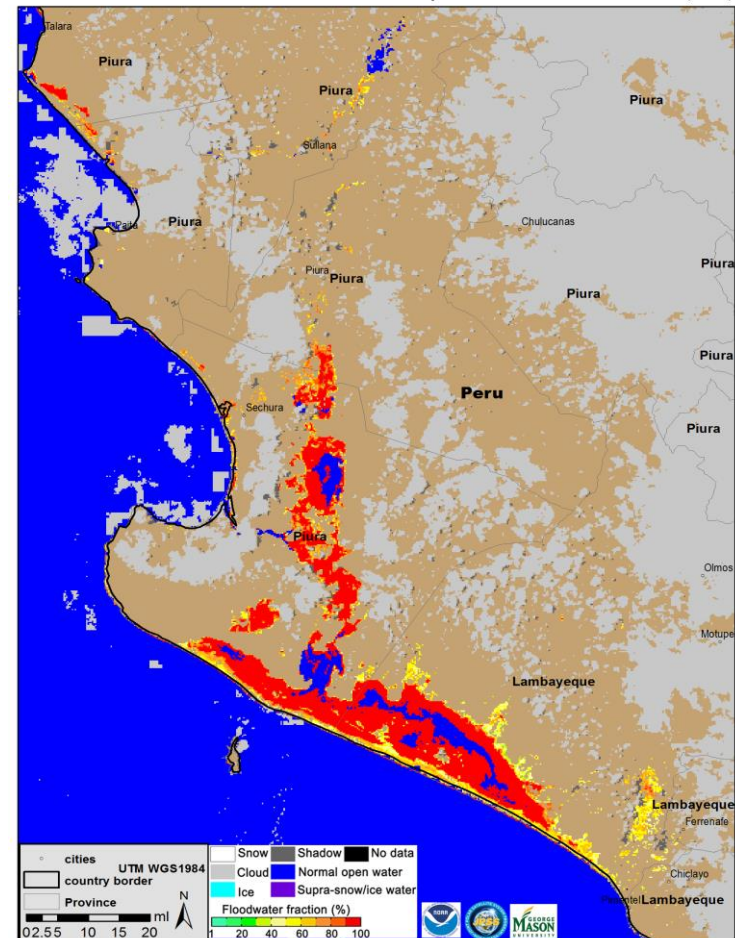
More detailed information is available on www.disasterscharter.org/web/charter/activate
For further inquiries please contact ExecutiveSecretariat@disasterscharter.org

Worldwide Capability

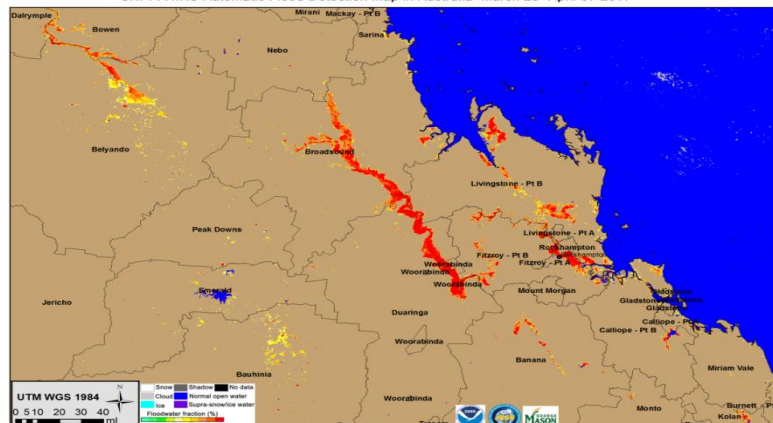
SNPP/VIIRS Automatic Flood Detection Map in Asia 23 July - 29 Aug. 2016



SNPP/VIIRS Automatic Flood Detection Map in Peru 23 Mar. 2017 18:48 (UTC)



SNPP/VIIRS Automatic Flood Detection Map in Australia March 28 - April 07 2017

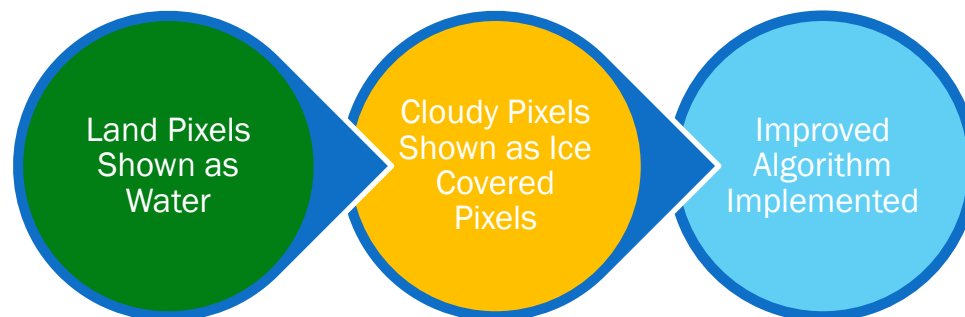


➤ VIIRS flood detection capability has been extended to the regions outside of USA

Keep Asking the Right Questions River Ice Product

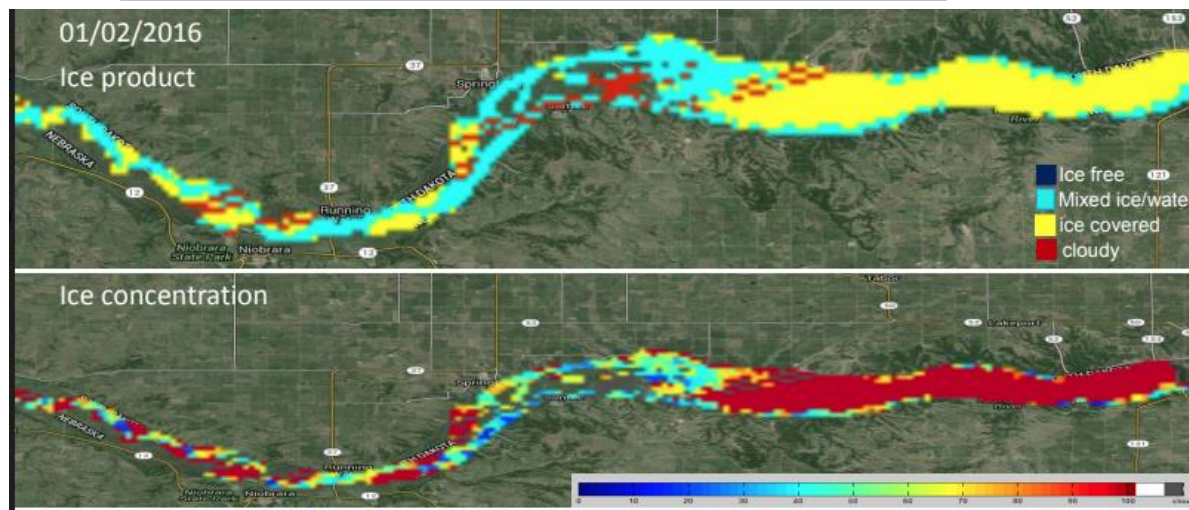
We Are Seeing Some Odd Things in the Product. Can That be Fixed?

2015



Can We Get Finer Detail on the Amount of Ice on the River?

2016

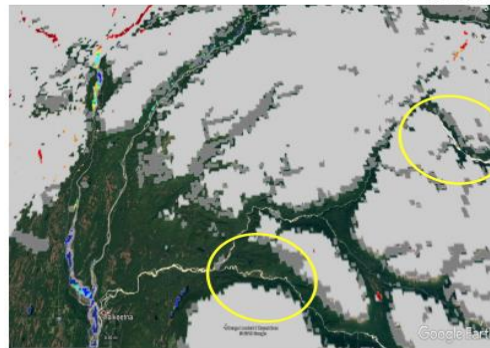


Keep Asking the Right Questions River Ice Product

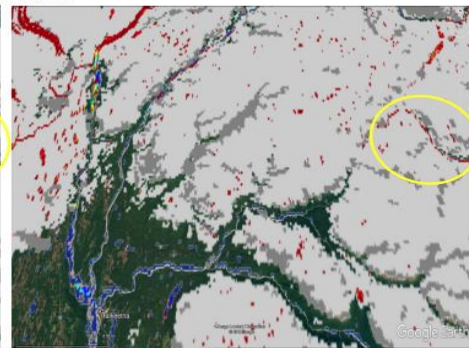
Can a Product be Created for Rivers Narrower than a VIIRS Pixel?

05/13/2018, Talkeetna and Susitna Rivers

Ice concentrations



Current product (covering wide sections)



merged product (covering wide and narrow rivers):
Talkeetna and Sheep Rivers are included



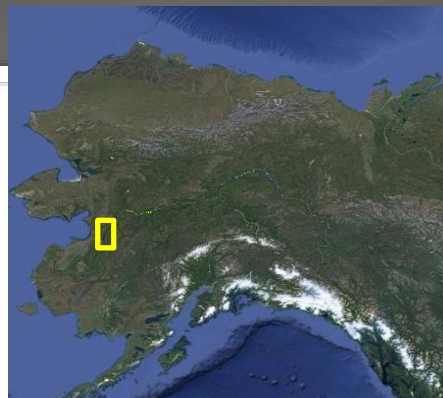
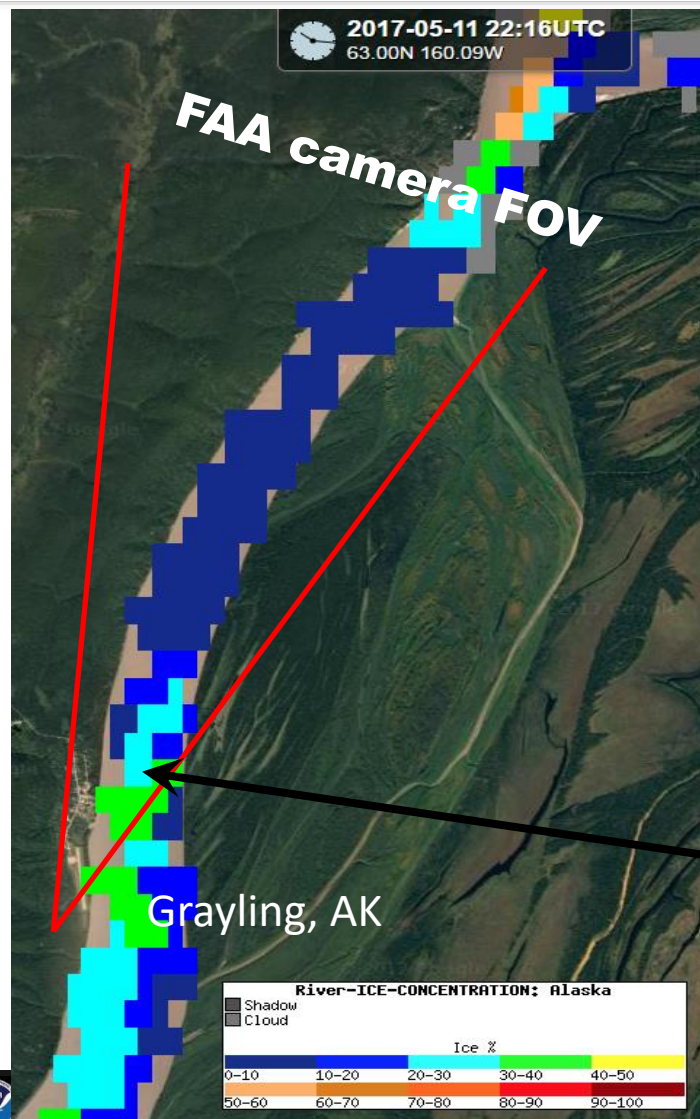
2018

The River Ice Product has Been Inconsistent from Pass-to-Pass, Can that be Fixed?

Persistent

?

Satellite vs FAA Camera



Melting ice may be quite dark causing underestimate of the ice concentration

Thu 11 May 2017 23:16:27 UTC
Thu 11 May 2017 15:16:27 AKDT

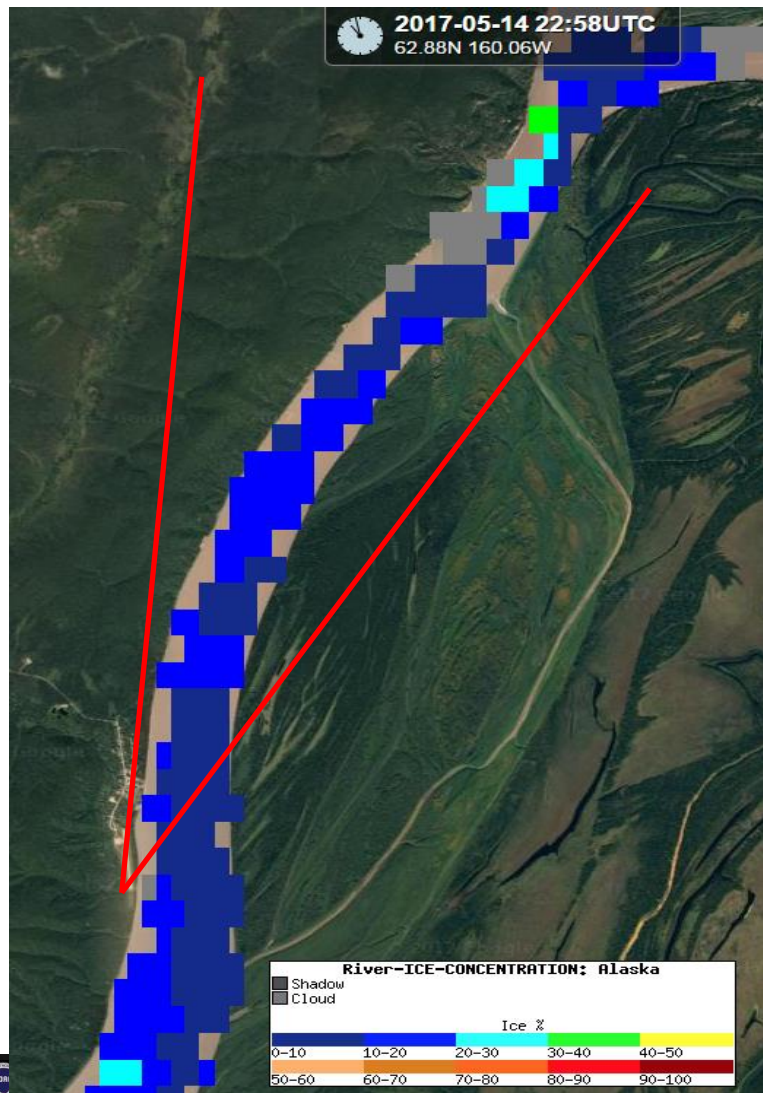
Grayling - NorthEast

See <http://avcams.faa.gov> for more information

FAA camera in Grayling, AK
(one hour time difference from satellite overpass)



Satellite vs FAA Camera



Fri 12 May 2017 19:52:30 UTC
Fri 12 May 2017 11:52:30 AKDT

Grayling - NorthEast
See <http://avcams.faa.gov> for more information





What the Future Holds?



- **Flood Mapping Product is in SPSRB Process to become operational.**
- **RealEarth and GeoCollaborate working to make River Ice and Flood Products more accessible to decisionmakers.**
- **Close coordination with FEMA and US Army Corp of Engineers provide products when needed for severe weather events.**
- **Initiative is working to determine long-term viability of River Ice Product.**



For More Information on the JPSS Program (WWW.JPSS.NOAA.GOV)



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**TWO SATELLITES, ONE
ORBIT, MANY BENEFITS**

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MISSION



SCIENCE



LAUNCH



NOAA VIEW